

**SUBSTITUTE SPECIFICATION**

1                   TUNABLE NARROW-BAND FILTER INCLUDING  
2                   SIGMA-DELTA MODULATOR

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4                   Christopher H. Dick  
5                   Frederic J. Harris

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7   **ABSTRACT OF THE DISCLOSURE**

8         Sigma-delta modulation ( $\Sigma\Delta M$ ) techniques provide a range  
9         of opportunities in a signal processing system for both  
10      increasing performance and datapath optimization along the  
11      silicon-area axis in the design space.  $\Sigma\Delta M$  technology,  
12      together with FPGA based signal processing hardware, can be  
13      combined to produce creative, high-performance and area-  
14      efficient solutions to many signal processing problems.